



# Architecture Best Practices for Project and Technical Leaders

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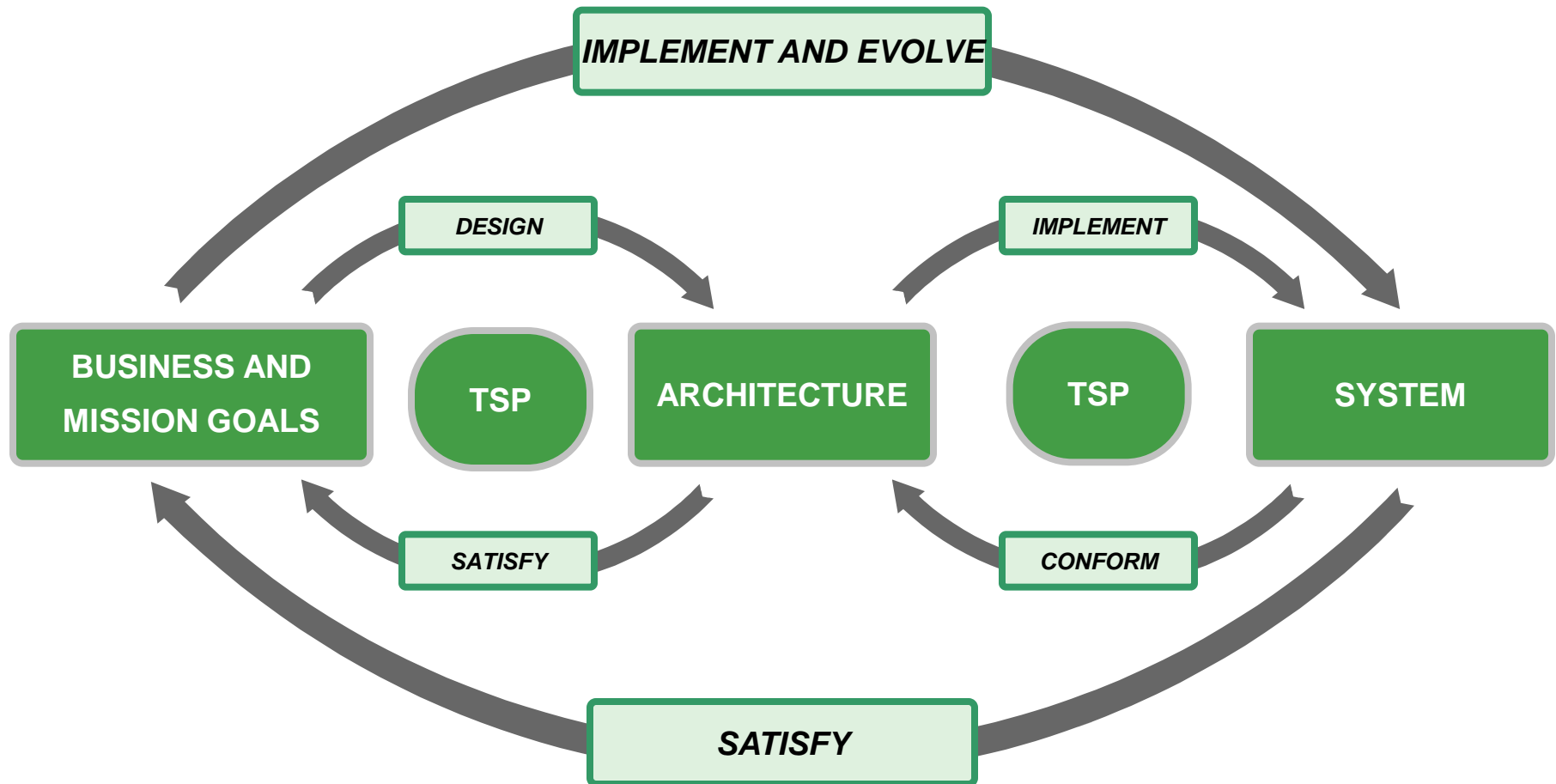
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# Architecture-Centric Engineering (ACE) Design and Analysis – with TSP



# What Drives Architectural Need?

There are no definitive studies or guidelines, probably because the answer is context dependent.

- ❑ More than 2 people
- ❑ More than 6 months effort
- ❑ More than 25-30 KLOC (thousands of lines of code; a VERY high number for 2 people over 6 months)
- ❑ Critical non-functional attributes (performance, safety, security, etc.)
- ❑ *No pre-existing architecture!* (...especially if someone other than the developer is attempting to maintain or enhance it)



# Why is Architecture Needed?

Represents *earliest* design decisions



- hardest to change
- most critical to get right
- communication vehicle among stakeholders

*First* design artifact addressing



Quality attributes  
(i.e., performance,  
security, usability)

Key to systematic *reuse*



- transferable, reusable abstraction

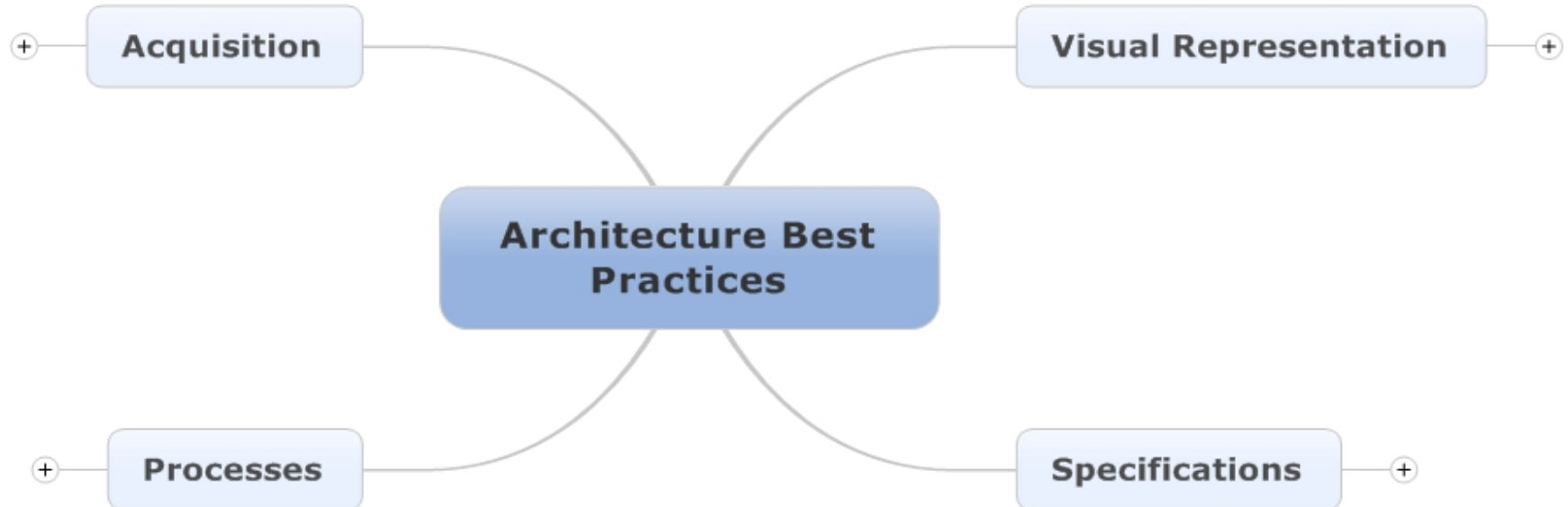
## What do I need to know?

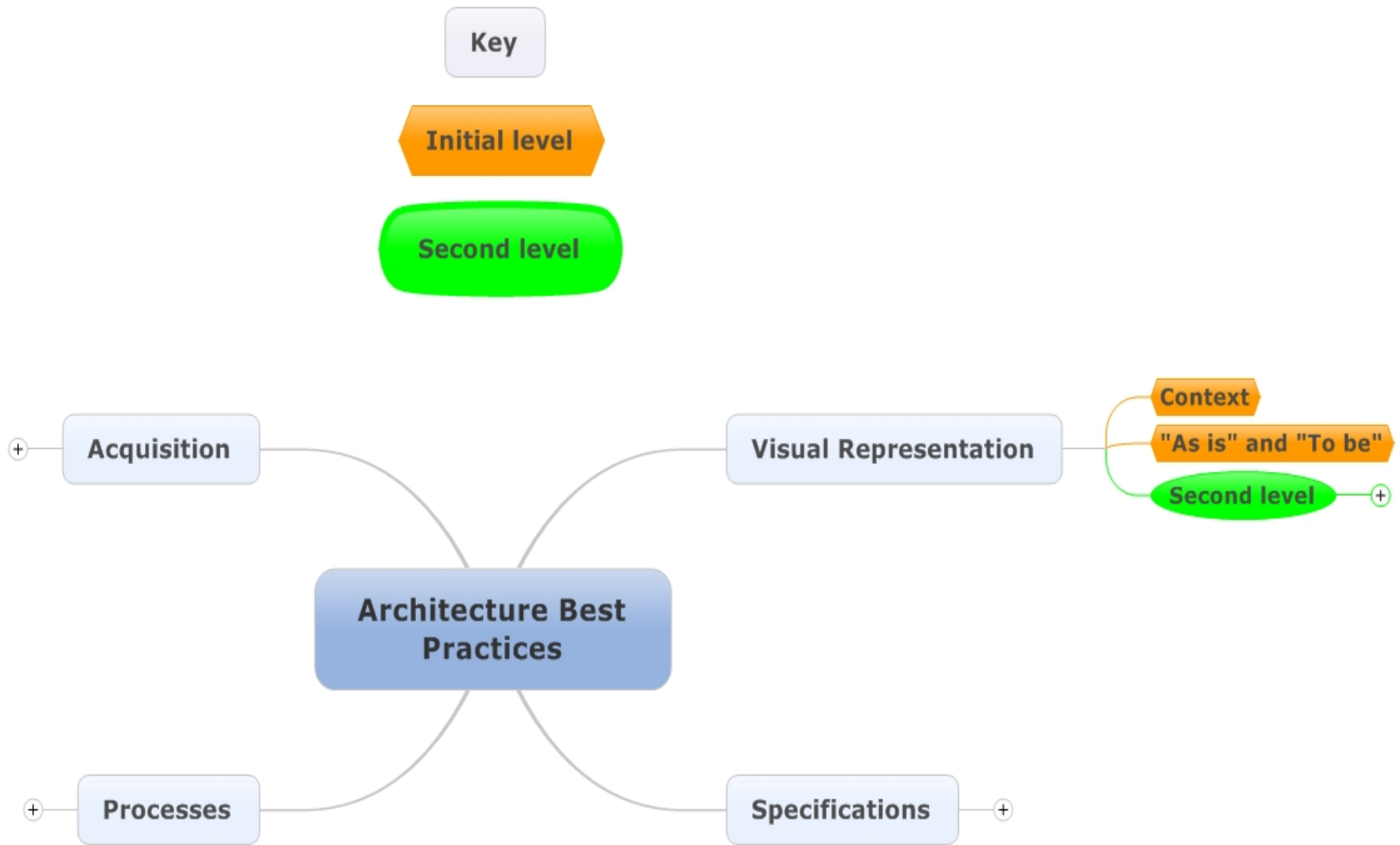


Key

Initial level

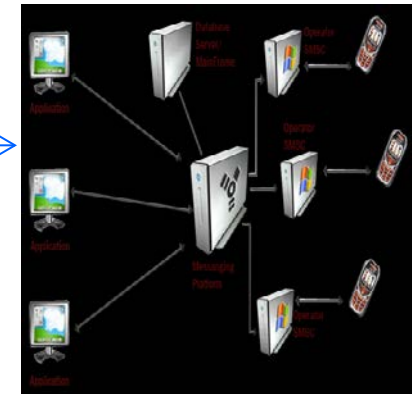
Second level







## Carriers' Gateway



Message  
Recipient

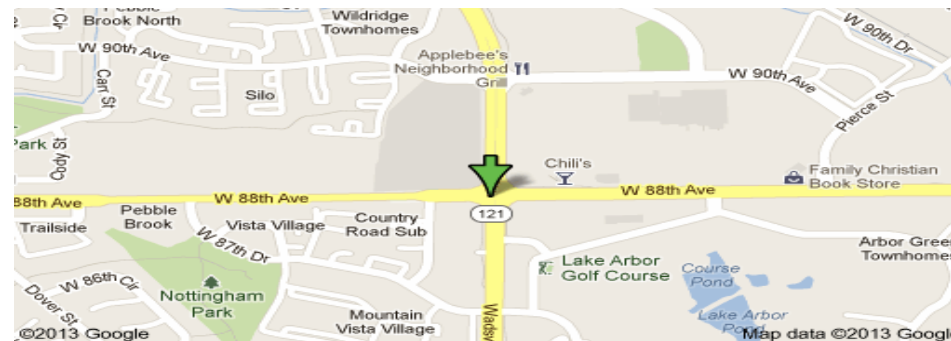


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Emergency  
Alerting  
System

Social media



First  
Responders

Local  
govt

Emergency Management  
Organization



Citizen calls 911

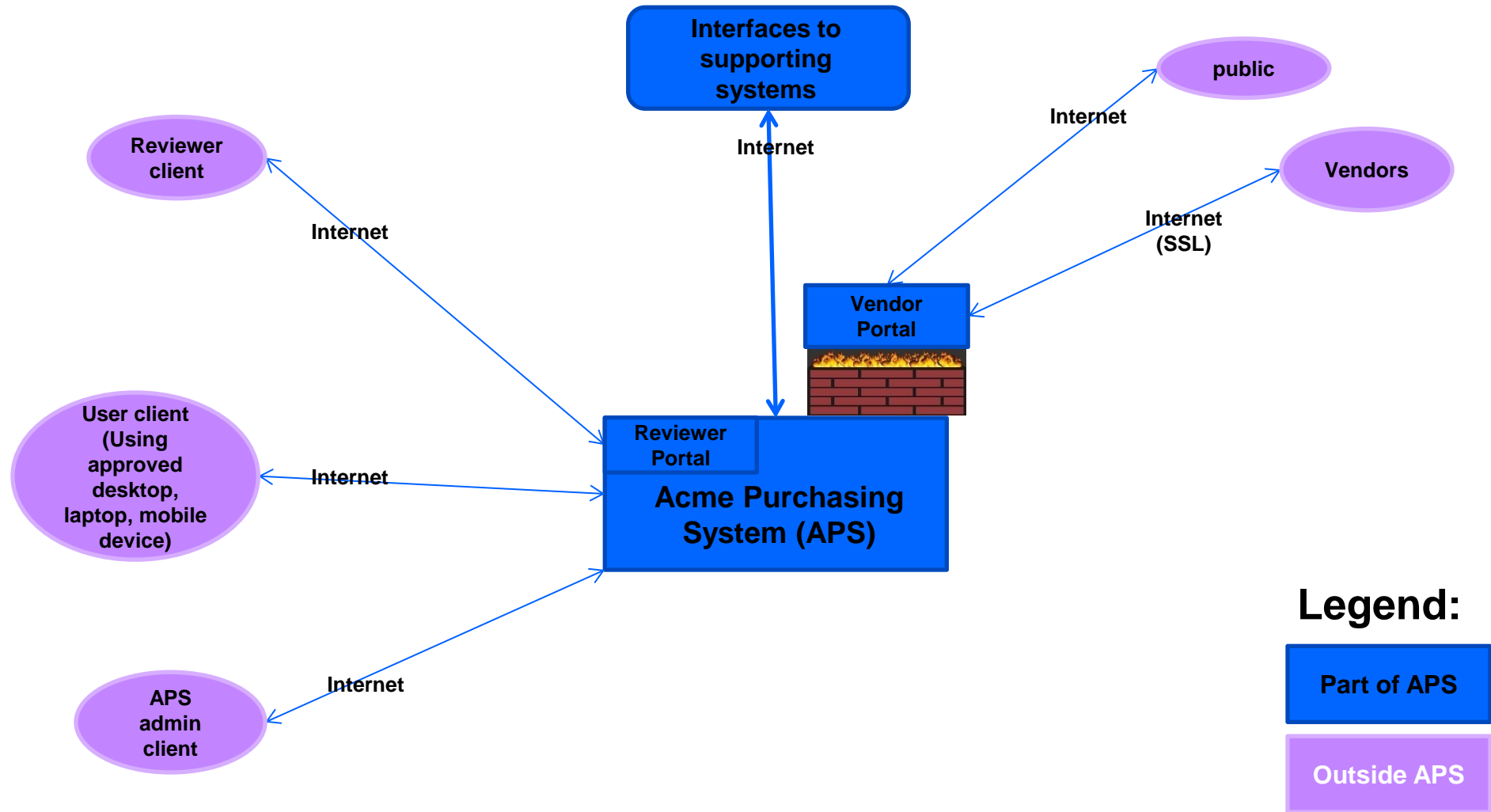


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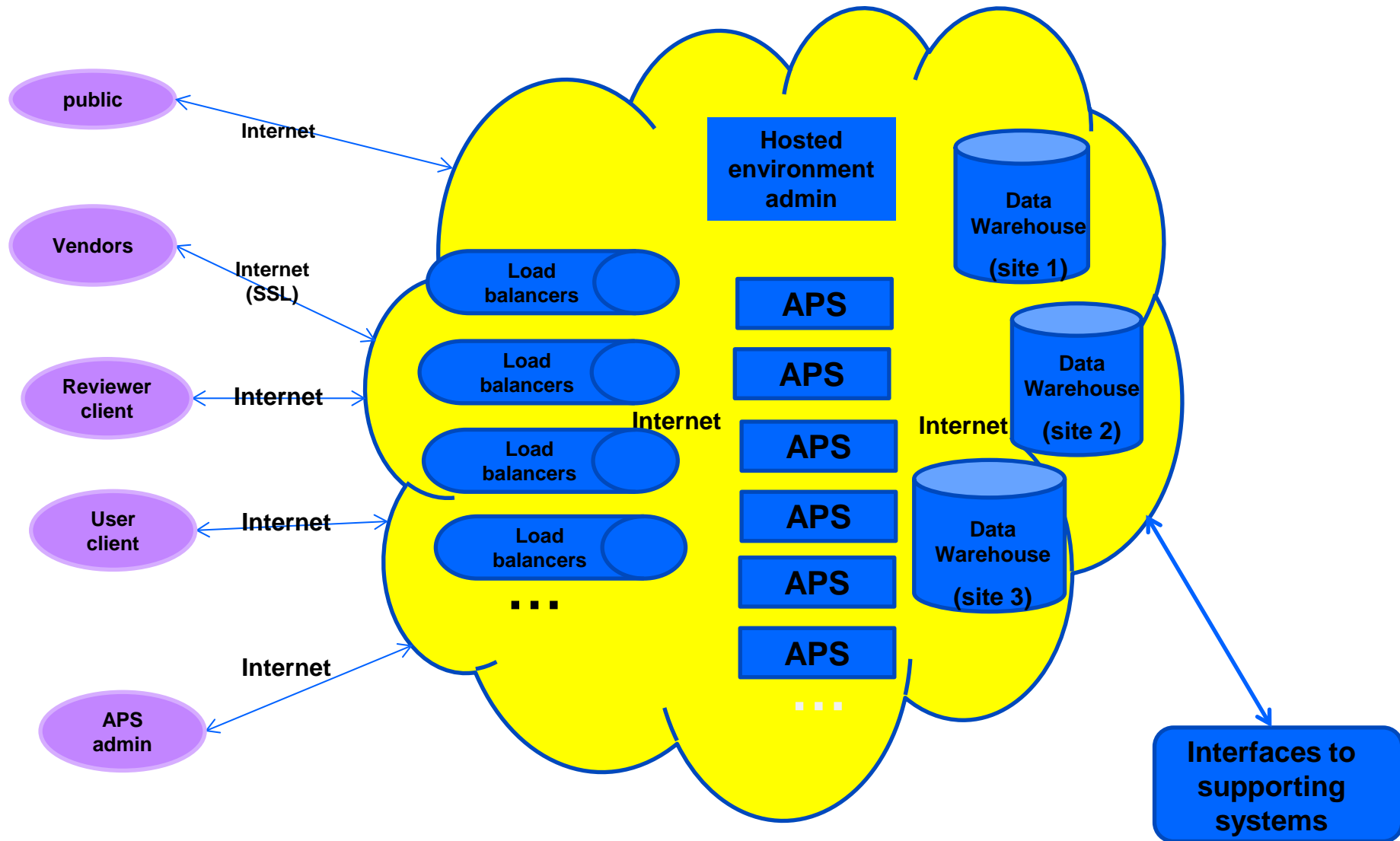
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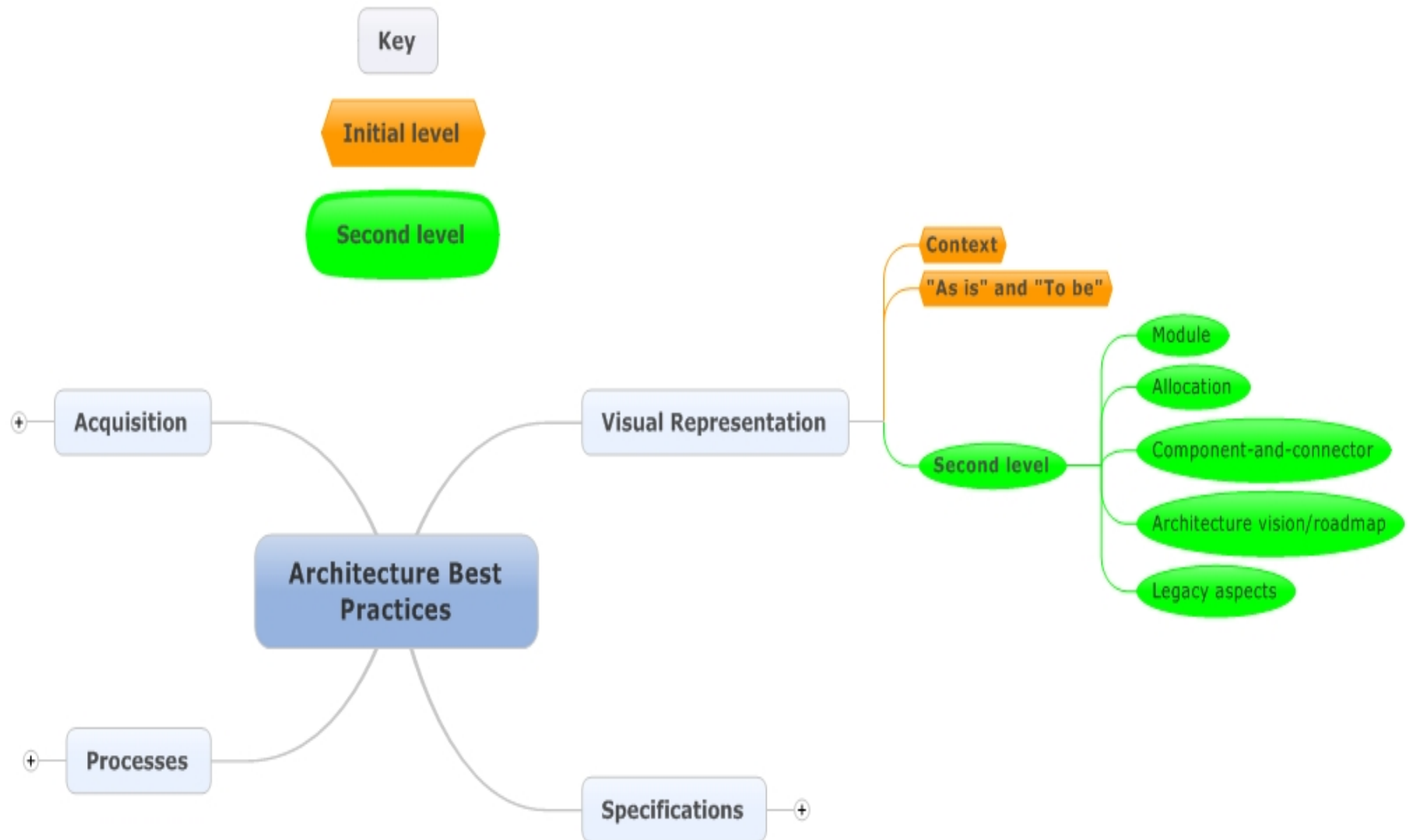
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# “As-Is” Standalone Implementation

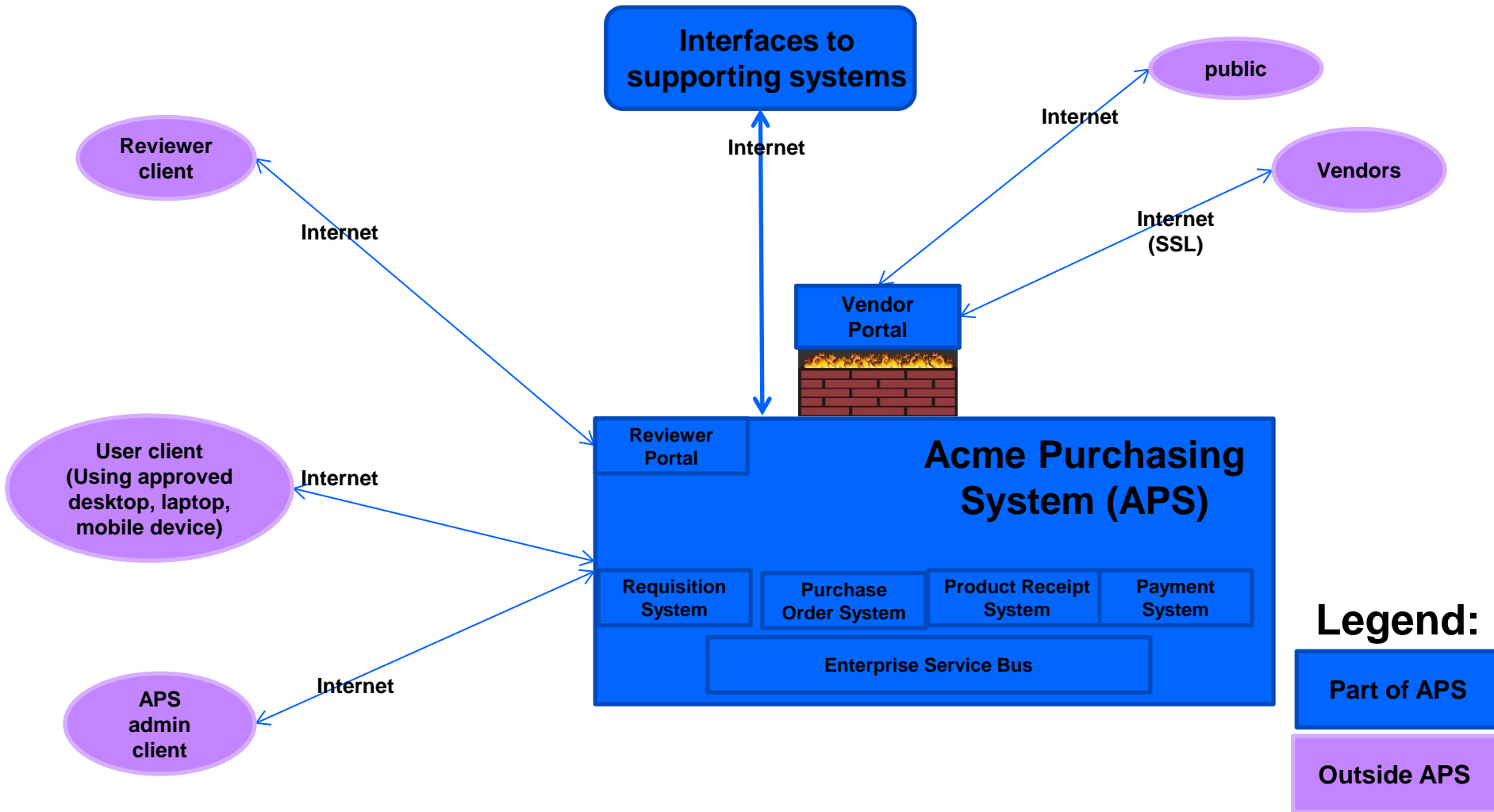


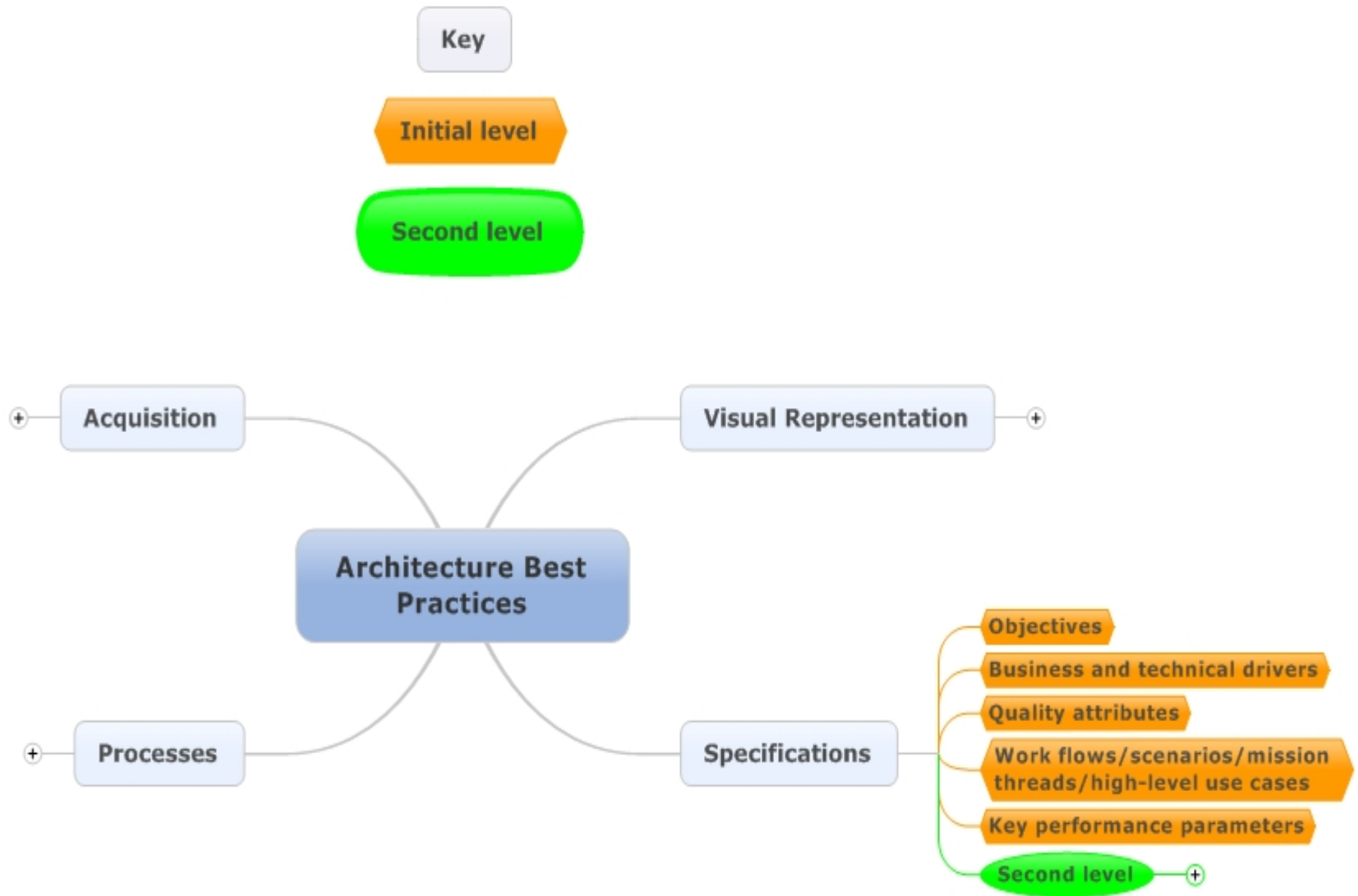
# “To-be” Hosting view

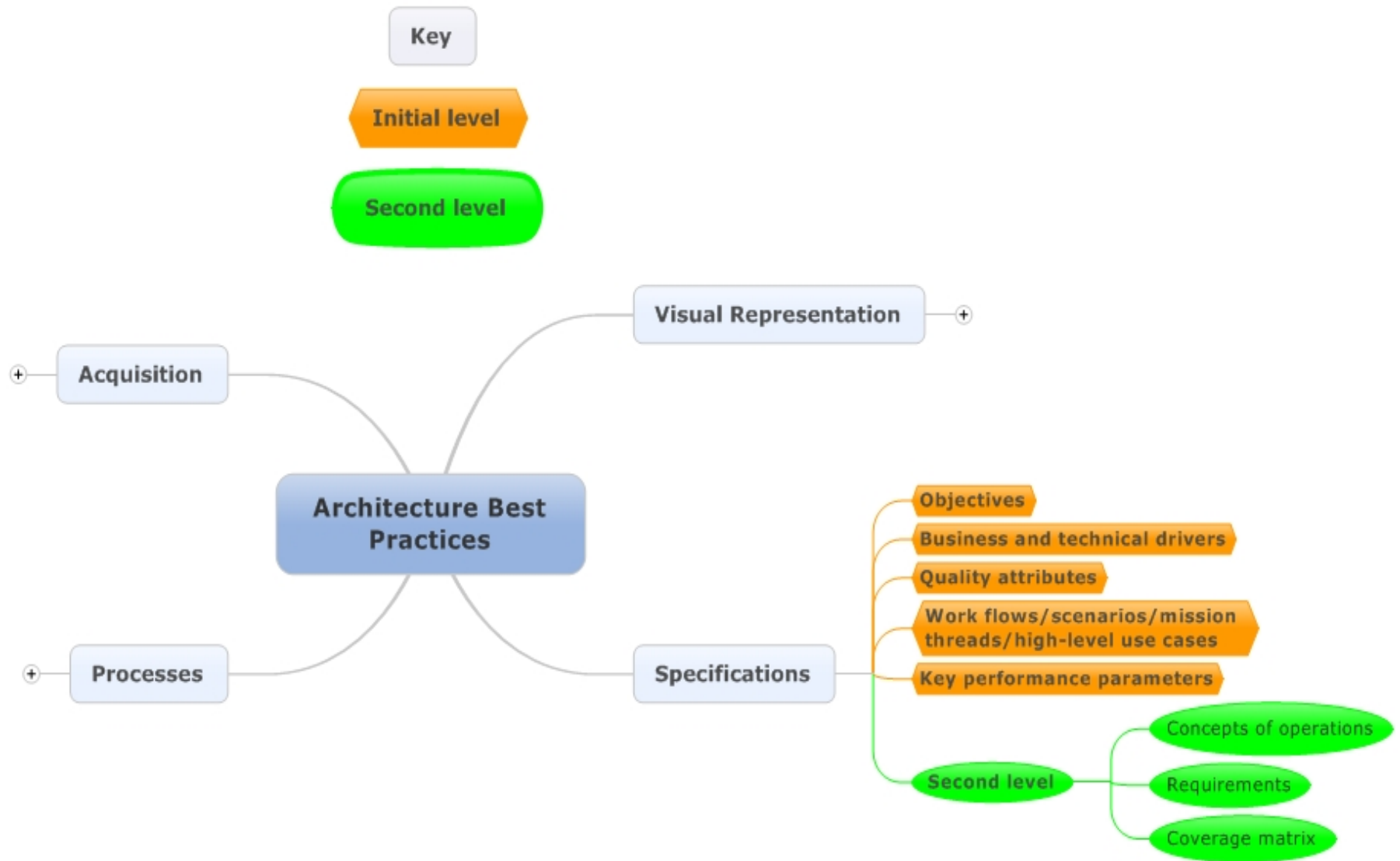


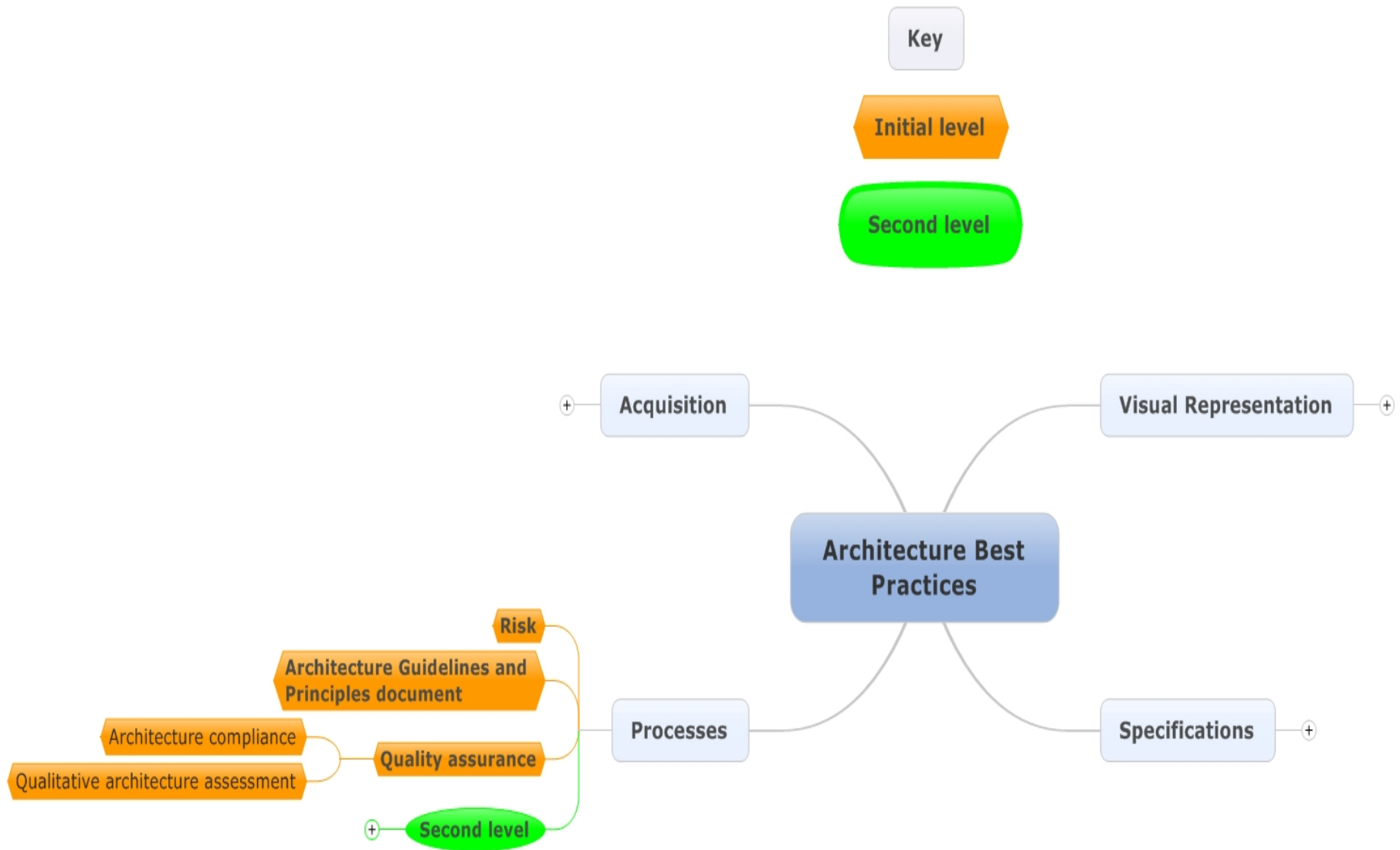


# APS Decomposition View









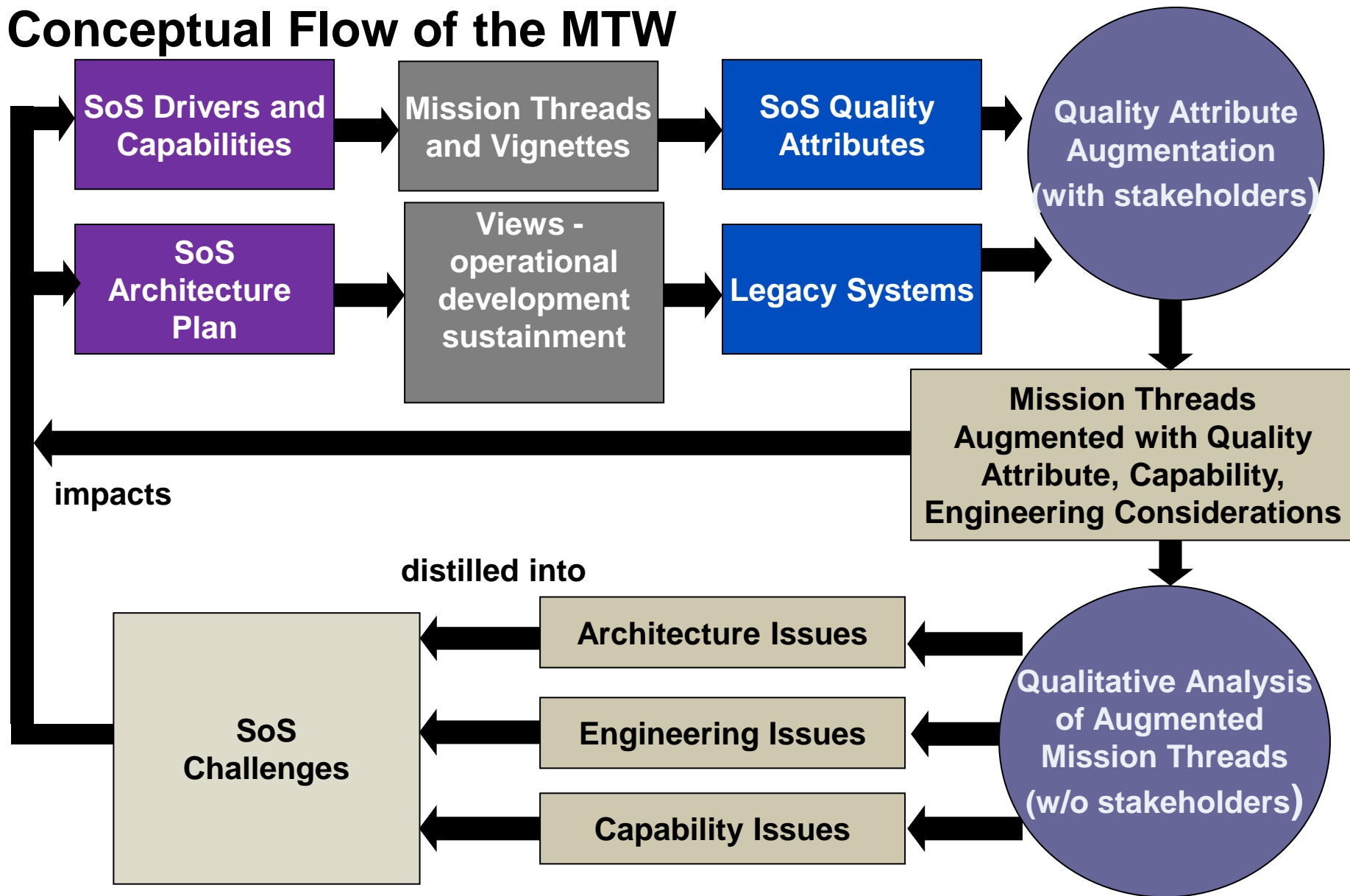
# Architecture Guidelines & Principles Document

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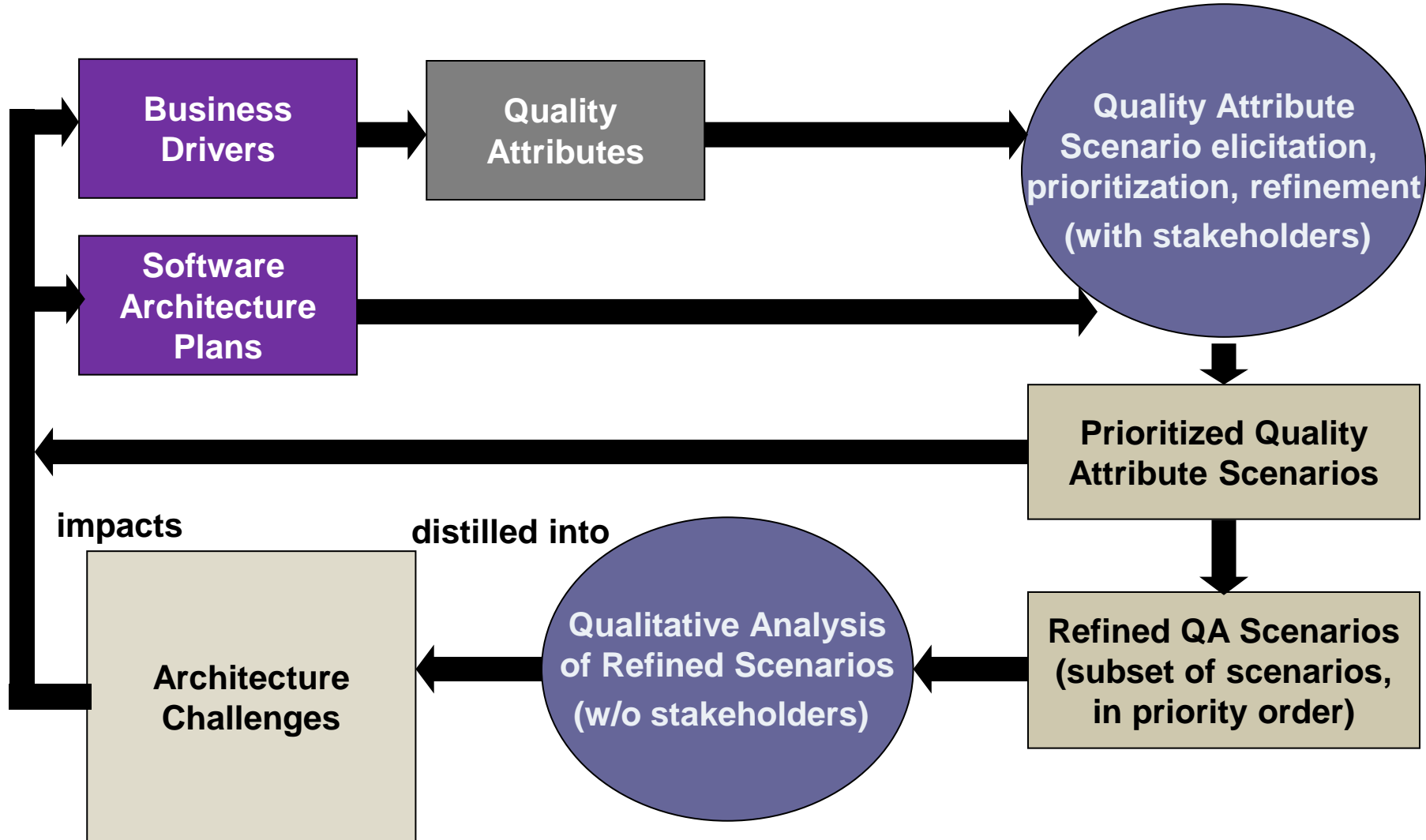
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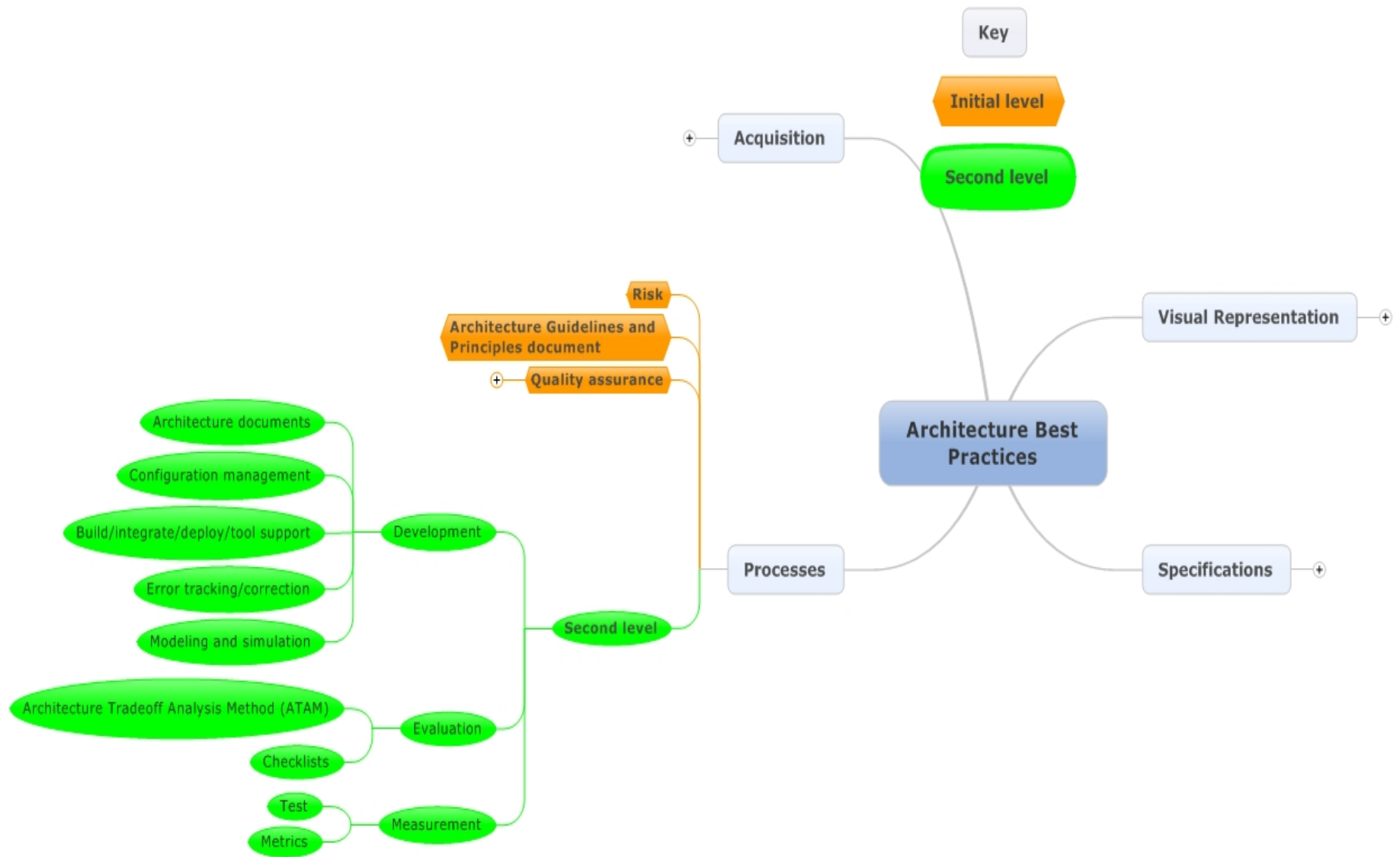


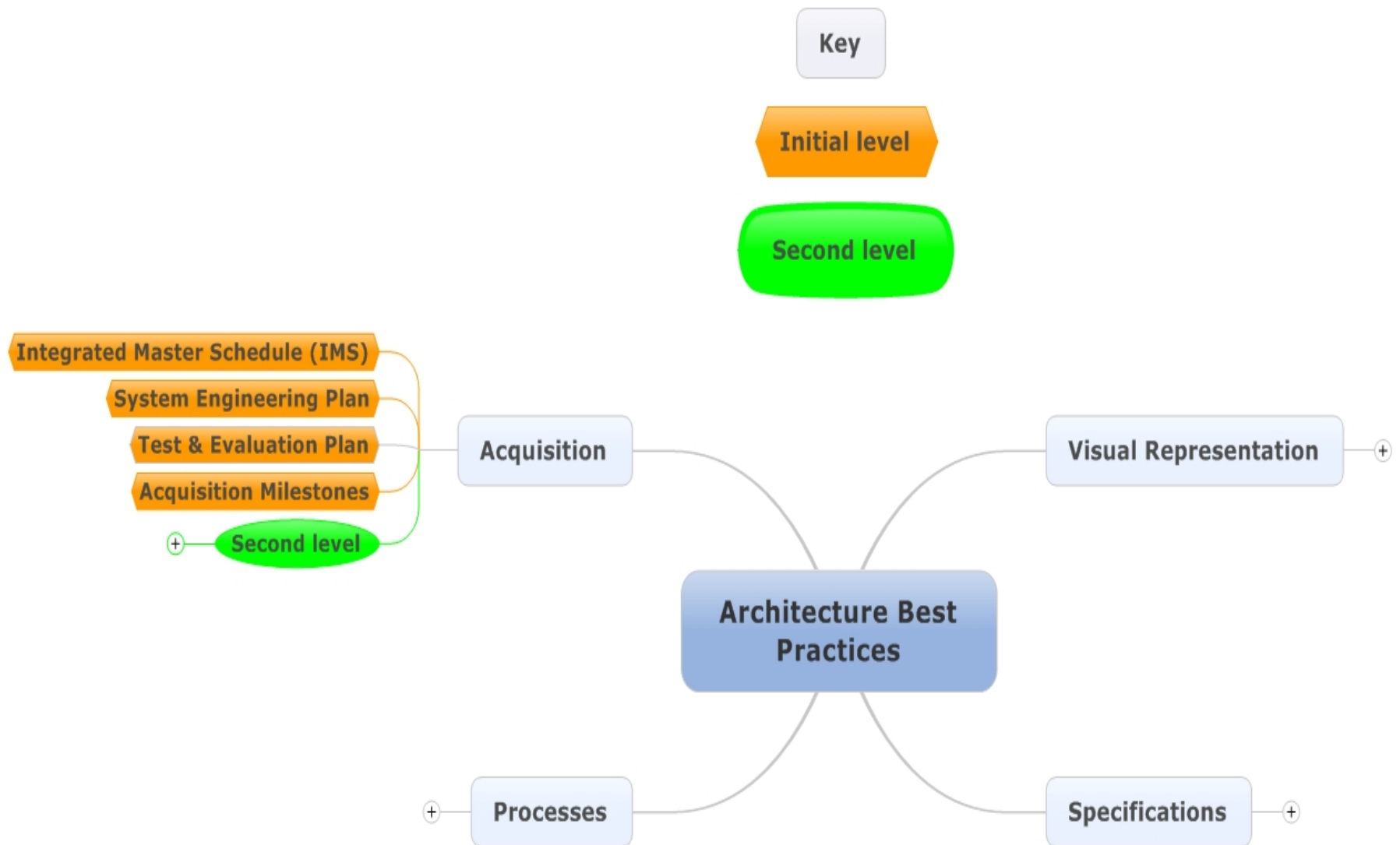
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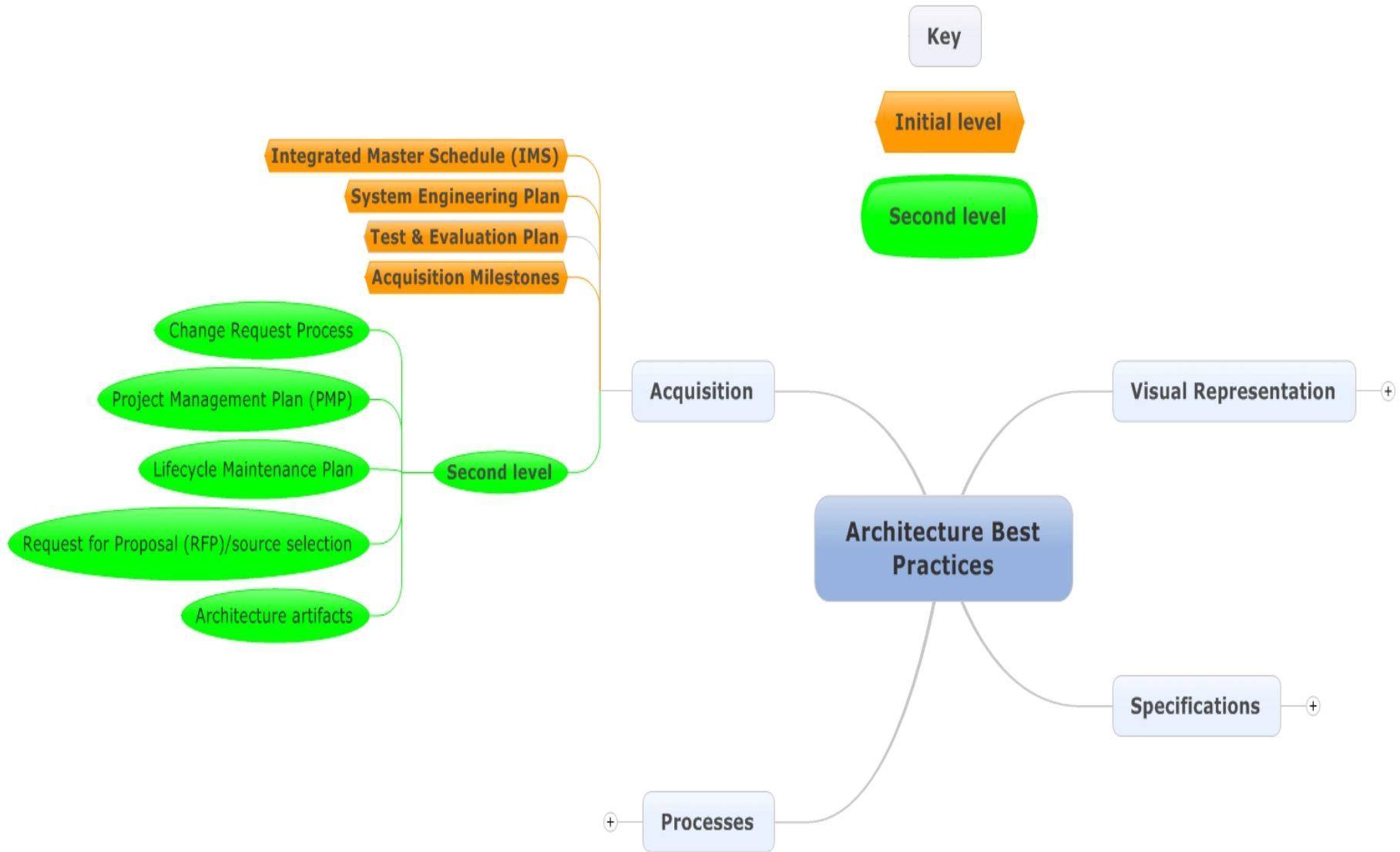


# Conceptual Flow of the QAW









# System Engineering Timeline



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